

EXHIBIT 1

WORK PLAN/ SAMPLING AND ANALYSIS PLAN

TRENTON RIVERFRONT PROPERTY 16.75 ACRE PARCEL, WEST JEFFERSON AVENUE TRENTON, MICHIGAN

for

DOWNRIVER AREA BROWNFIELD CONSORTIUM

MICHIGAN, U.S. EPA REGION 5

APRIL 1999

AKT Project No. 1600.20-01

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SUBSURFACE INVESTIGATION AND BEA PREPARATION WORK PLAN/SAMPLING AND ANALYSIS PLAN TRENTON RIVERFRONT PROPERTY WEST JEFFERSON AVENUE TRENTON, MICHIGAN

1.0 INTRODUCTION

The Downriver Area Brownfield Consortium (DABC) has retained AKT Environmental Consultants, Inc. (AKT), to conduct a Subsurface Investigation at a 16.75 acre parcel of land located along West Jefferson Avenue in Trenton, Michigan (subject property). See Figure 1 for a Topographic Site Location Map. This Work Plan/Sampling and Analysis Plan (Work Plan/SAP) presents the field procedures for the subsurface investigation to be conducted at the subject property. The purpose of this Work Plan/SAP is to document the sampling and data-gathering methodologies that will be used and the frequency, locations, and rationale for the sampling activities. This Work Plan/SAP contains the procedures and protocol necessary to conduct all planned investigation and sampling activities.

2.0 PROPERTY LOCATION/DESCRIPTION

The subject property is located near the northeast corner of West Jefferson Avenue and Helen Avenue in the City of Trenton, Michigan. The subject property (parcel identification number 054-011-099-0003-004) consists of 16.75 acres and is situated in the northeast quarter (NE 1/4) of Section 18, Township 4 South (T. 4S.), Range 11 East (R. 11E.), Wayne County, Michigan.

The subject property slopes gradually to the east and is located in a commercial, industrial and residential area of Trenton, Michigan. The subject property consists primarily of vacant land vegetated with tall grasses and trees. The Trenton Channel of the Detroit River surrounds the eastern boundary of the subject property, forming a peninsula. An unimproved road extends onto the subject property from West Jefferson Avenue and ends at the Detroit River shoreline. The northeastern portion of the property has sparse vegetation and is presently covered with foundry slag material. At the time of AKT's site inspection, areas along the road, the shoreline, midsection and along the southern edge of the property contained miscellaneous debris.

The property is bounded by a 1.04-acre strip of undeveloped land following by industrial development to the north; Jefferson Avenue followed by a commercial office building and residential houses to the west; a municipal park and residential houses to the south; and the Trenton Channel of the Detroit River followed by Grosse Ile to the east.

The subject property is currently vacant and contains no structures. However, an unimproved road (paved with a slag material) extends across the northern portion of the subject property. Two single-family residential houses were located on the western portion of the subject property from at least 1937 until 1976, but have since been demolished.

2.1 CURRENT USE

According to local tax assessment records, the subject property is currently owned by Ellias Realty of Trenton, Michigan. According to a Zoning District Map obtained from the City of Trenton, the eastern portion of the subject property is zoned Waterfront Marina and the majority of the western portion is zoned One-Family Residential (R-2). In addition, a small area at the southwest portion of the subject property is zoned Local Business (B-1).

2.2 PREVIOUS ENVIRONMENTAL REPORTS

McDowell & Associates (MA) conducted a Phase I Environmental Site Assessment (ESA) of the subject property for Crosswinds Communities in 1997. The recognized environmental conditions (RECs) identified in MA's ESA report include the following:

- The topography of the eastern portion of the subject property and the peninsula, which extends into the Trenton Channel, has changed greatly since 1949. This area has been filled with potentially contaminated materials.
- The subject property extends into the Trenton Channel of the Detroit River, the sediments of which are listed as a state hazardous waste site and have been found to be contaminated.
- The McLouth Steel site, which adjoins the subject property, was identified in the governmental records as a CERCLIS Site, a Hazardous Waste TSDF and Generator Facility, an ERNS Site, and a Leaky Underground Storage Tank (LUST) Site.
- CERCLIS information obtained for McLouth Steel indicates that the subject property is part of McLouth Steel, as shown in a boundary survey. Thus, the subject property is listed as a portion of a CERCLIS site. CERCLIS information stated that drums were buried at McLouth Steel, however an exact location was not provided.

The presence of the McLouth Steel facility represents an REC to the subject property. However, based on AKT's review of the file information included in MA's Phase I ESA report and other information obtained during AKT's Phase I ESA, it appears unlikely that "buried drums," referenced in MA's report, are located on the subject property.

2.3 RECOGNIZED ENVIRONMENTAL CONDITIONS

Based on the findings of the site inspection, conversations with appropriate parties, and a review of other available information, AKT's Phase I ESA (*Phase I Environmental Assessment Report 16.75-Acre Parcel, West Jefferson Avenue, Trenton, Michigan, AKT, 1999*) identified the following RECs and other potential environmental concerns associated with the subject property:

- Landfilling and sediment deposition over the past 50 years have created significant changes in the shoreline and eastern topography of the subject property. Evidence of disturbed land and/or landfilling activities was observed on the eastern, northern, and west-central portions of the subject property during AKT's aerial photograph review. The fill material is generally thought to consist primarily of slag and/or foundry sand and may be contaminated. The actual characteristics and extent of the fill material is unknown.
- The Trenton Channel (including the lagoon area located to the immediate east of the subject property's shoreline) has been identified as having sediments contaminated with oil and grease, heavy metals, mercury, polynuclear aromatic hydrocarbons (PNAs), and polychlorinated biphenyls (PCBs). According to Mr. Arthur Ostaszewski of MDEQ, the MDEQ-SWQD is currently working with the Army Corps of Engineers and the United States Environmental Protection Agency (USEPA) to implement a Remedial Action Plan. The remedial action will consist of the mechanical dredging of approximately 20,675 cubic yards of sediment from the lagoon area. Implementation of the Remedial Action Plan is pending the selection of a suitable sediment treatment and/or disposal plan.
- According to the subject property's legal description and the area plat map, the subject
 property extends into the Trenton Channel and encompasses the lagoon area. However,
 because this portion of the site is considered part of the "waters of the state," its use and
 development is restricted by state and federal regulations. According to Mr. Ostaszewski, a
 Habitat Restoration Plan for the lagoon area is being considered. Therefore, future
 development plans for the subject property may require approval from the MDEQ, USEPA,
 and/or the Army Corp of Engineers.
- Obvious evidence of suspect wetland habitat observed during AKT's site inspection appeared to be limited to the eastern shoreline. Local, state, and or federal wetland regulations may restrict future development along the shoreline.
- Several piles of refuse and debris, possibly representing routine dumping, were observed
 on the subject property during AKT's site inspection. No obvious evidence of hazardous
 materials or surface staining was noted in or around the debris piles.

• The Edward C. Levy Company Plant Number 5 and the former McLouth Steel facility, both located to the north of the subject property, were identified on several environmental databases. Concerns identified in connection with the Edward C. Levy property included former hazardous waste surface impoundments and piles of fill material and debris. Concerns identified at the former McLouth Steel facility included waste piles, debris piles, aboveground hazardous waste storage tanks, sludge pits, drying basins, and buried drums. In AKT's opinion, these sites represent a potential environmental concern to the subject property. This opinion is based on (a) their proximity to the subject property, (b) their inclusion on several environmental databases, (c) the historical use of the former McLouth Steel property for heavy industrial activities since the 1940s, and (d) the anticipated groundwater flow (and surface water flow) to the southeast (generally toward the subject property).

3.0 PURPOSE AND SCOPE

The purpose of AKT's subsurface investigation is to evaluate the RECs associated with the subject property. The investigation is not being performed in response to a specific release, but rather as part of a brownfield redevelopment action to ready the property for redevelopment. Once evaluated, AKT will assess the site to determine if the property meets the definition of a "facility," as defined by PA 451, Part 201 of the Natural Resources and Environmental Protection Act (NREPA), 1994 as amended. If the results of these investigations define the site as a facility, AKT will complete a Baseline Environmental Assessment (BEA), and upon WCBRA's request, petition the MDEQ for an exemption from liability for the existing contamination. AKT's scope of work to complete the BEA is based on Section 20126(1)(c) of Part 201 and MDEQ Instructions for the Preparation and Submittal of Baseline Environmental Assessments, dated March 3, 1999.

AKT understands that the intended future use of the property will be residential; therefore, AKT anticipates completing a Category N BEA. A Category N BEA is used for sites where (1) contamination has been detected above a residential standard and (2) hazardous substances are not expected in the future use of the property. If contamination is not detected at the subject property above a residential standard, a BEA cannot be completed, and therefore due-diligence activities may be deemed complete.

A summary of the proposed soil and groundwater sampling program is listed on Table 1. Table 1 also presents the RECs and associated sample and analytical requirements. See Figure 3 for proposed boring locations.

4.0 SUBSURFACE INVESTIGATION FIELD ACTIVITIES

The field investigative activities will include soil and groundwater sampling using Geoprobe (CPA) sampling techniques. In addition, surface soil sampling will be conducted using hand-auger sampling techniques. See Table 1 for additional information regarding the sampling program.

5.0 INVESTIGATIVE PROCEDURES

This section presents the procedures and equipment for the proposed subsurface investigation activities at the subject property. The sampling and analytical method requirements, sample containers, preservation, and holding time requirements are presented on Table 4 of the Quality Assurance Project Plan (QAPP) (Quality Assurance Project Plan, AKT, 1999).

Standard forms including soil boring logs, daily field report forms, and chain-of-custody forms are provided in Attachment C of the QAPP. Geoprobe sampling activities will be conducted in accordance with American Standard Testing and Materials (ASTM) publication ASTM D-4700.

5.1 GEOPROBE SOIL BORINGS

AKT proposes to drill 10 Geoprobe soil borings and collect soil samples from these borings. In addition, 8 surface soil samples will be collected using hand auger sampling techniques. See Figure 3 for the soil sampling locations. See Table 1 for the sampling and analytical program.

5.1.1 Depth of Geoprobe Borings

Soil borings will be drilled to approximately 16 feet below ground surface (bgs) or until the underlying clay or bedrock is encountered. Soil samples from the borings will be obtained continuously and field screened with a photoionization detector (PID). Each soil sample will be visual classified in accordance with the Unified Soil Classification System (USCS).

5.1.2 Sample Collection Methodology

Soil samples will be collected in accordance with AKT SOP-1. See Attachment D of the QAPP for a copy of this SOP.

Soils - VOC sample will be collected in Meather than the collected in Meather will do the OH black

5.1.3 Selection of Soil Samples for Analysis

A maximum of 20 soil samples will be collected from the borings and submitted for analyses based on the following:

- Known and/or suspected depth of release,
- Visual or olfactory indication of impact,
- Highest PID level reading,
- Sand/clay interface.

See Table 1 for the analytical sampling program.

In addition to the operating procedures presented in AKT SOP-1 (Attachment D, QAPP), the following procedures will be followed when collecting soil samples for laboratory analysis:

- 1. Geoprobe sampling locations will be staked in the field and recorded in a logbook.
- 2. If concrete is present, coring will be performed using an electric coring machine.
- 3. Soil samples will be collected continuously (or, if necessary, 4-foot intervals) to a depth of approximately 16 feet bgs, or until the underlying clay or bedrock is encountered.
- 4. A maximum of 20 soil samples (2 from each boring) will be selected for laboratory analysis and placed into the appropriate sample containers.
- 5. Sample containers will be labeled as described in Section 2.3 of the QAPP.
- 6. Each sample container will be individually sealed in a plastic bag and place into a cooler for storage and shipment, following AKT QAPP guidelines.
- 7. Samples will be maintained at approximately 4 ° C during storage and shipment to the laboratory.
- 8. Each filled sample cooler will be sealed with a *Custody Seal* (AKT Form No. FF-6) prior to shipment to the laboratory.
- 9. Sampling equipment will be decontaminated in accordance with AKT SOP-4, presented in Attachment D of the QAPP.
- 10. Boreholes will be backfilled in accordance with AKT SOP-1.
- 11. Lithologic characteristics (color, texture, grain size and consistency) of the soil at each boring location will be recorded on AKT Form No. FF-4 in accordance with USCS.
- 12. Soil boring locations will be staked and measured for horizontal control to a site-specific datum by trained AKT personnel. A scaled boring location map will be included in the subsurface investigation report.

Sampling equipment will include the following:

• Health and safety equipment/health and safety plan (Exhibit 2 of QAPP),

- Geoprobe,
- Concrete coring machine,
- All appropriate field forms, including chain-of-custody,
- Sample labels and custody seals,
- Logbooks, marking pens, overnight courier air bills and pouches,
- PID meter,
- Distilled or deionized water,
- Cooler with ice,
- Laboratory grade detergent, stiff brush, bucket, wash tub,
- Sample containers and packaging material,
- Tape measure,
- Camera and film.

5.2 HAND-AUGER SOIL BORINGS

AKT anticipates collecting one soil sample for laboratory analysis from each of the eight handauger soil borings. See Figure 3 for the hand auger surface sampling locations. See Table 1 for the sampling and analytical program.

5.2.1 Depth of Hand-Auger Borings

The maximum depth to which hand-auger borings will be installed is approximately 6-inches bgs. A maximum of eight soil samples will be submitted for laboratory analysis.

5.2.2 Sample Collection Methodology

Hand-auger samples will be obtained in accordance with AKT SOP-1. See Attachment D of the QAPP for a copy of this SOP.

5.2.3 Selection of Hand Auger Samples for Analysis

Hand Auger samples will be collected from ground surface to approximately 6-inches bgs. The following procedures will be followed when collecting hand-auger samples for laboratory analysis:

- 1. Hand-auger sample locations will be staked in the field and recorded in a logbook.
- 2. If concrete is present, coring will be performed using an electric coring machine.
- 3. Soil samples will be collected continuously to a depth of approximately 6-inches bgs.
- 4. Eight soil samples will be collected for laboratory analysis and placed into the appropriate sample containers.
- 5. Sample containers will be labeled as described in Section 2.3 of the QAPP.
- 6. Samples will be maintained at approximately 4 ° C during storage and shipment to the laboratory for analysis.
- 7. Sampling equipment will be decontaminated in accordance with AKT SOP-4, presented in Attachment D of the QAPP.
- 8. Boreholes will be backfilled in accordance with AKT SOP-1.
- 9. Lithologic characteristics (color, texture, grain size and consistency) of the soil at each hand-auger soil boring location will be recorded on AKT Form No. FF-4 in accordance with USCS.
- 10. Hand-auger soil boring locations will be staked and measured for horizontal control to a site-specific datum by trained AKT personnel. During preparation of the Subsurface Investigation report, the locations will be transferred to a scaled map.

Hand-auger sampling equipment will include the following:

- Health and safety equipment/health and safety plan (Exhibit 2 of the QAPP),
- Stainless steel hand-auger,
- All appropriate field forms, including chain-of-custody,
- Sample labels and custody seals,
- Logbooks, marking pens, overnight courier air bills and pouches,
- PID meter,
- Distilled or deionized water,
- Cooler with ice,
- Laboratory grade detergent, stiff brush, bucket, wash tub,
- Sample containers and packaging material,
- Tape measure,
- Camera and film.

5.3 GROUNDWATER SAMPLING

Groundwater samples will be collected from a maximum of six of the ten Geoprobe borings. Groundwater sample locations will be determined in the field. Samples will be collected from areas that will best characterize the groundwater beneath the property. See Table 1 for the sampling and analytical program.

5.3.1 Depth of Groundwater Samples

Groundwater samples will be collected from the upper three feet of the water table in accordance with AKT SOP-2. See Attachment D of the QAPP for a copy of this SOP.

5.3.2 Sample Collection Methodology

Groundwater samples will be obtained in accordance with AKT SOP-2. See Attachment D of the QAPP for a copy of this SOP. See Table 1 for the sampling and analytical program.

5.3.3 Selection of Groundwater Samples for Analysis

Groundwater samples will be collected from the upper three feet of the water table. The following procedures will be followed when collecting groundwater samples for laboratory analysis:

- 1. Groundwater sampling locations will be staked in the field and recorded in a logbook.
- 2. Dedicated/disposable sample tubing will be used to collect each groundwater sample to limit the potential for cross-contamination.
- 3. Six groundwater samples will be collected for laboratory analysis and placed into the appropriate sample containers.
- 4. Sample containers will be labeled as described in Section 2.3 of the QAPP.
- 5. Samples will be maintained at approximately 4 ° C during storage and shipment to the laboratory for analysis.
- 6. Groundwater sampling locations will be staked and measured for horizontal control to a site-specific datum by trained AKT personnel. During preparation of the Subsurface Investigation report, the locations will be transferred to a scaled map.

Groundwater sampling equipment will include the following:

- Health and safety equipment/health and safety plan (Exhibit 2 of the QAPP),
- Peristaltic pump and appropriate tubing,

- Conductivity, pH, and temperature meter(s),
- Appropriate field forms, including chain-of-custody,
- Sample labels and custody seals,
- Logbooks, marking pens, overnight courier air bills and pouches,
- PID meter.
- Distilled or deionized water,
- Cooler with ice,
- Sample containers and packaging material,
- Camera and film.

5.4 LOCATION AND ELEVATION SURVEY

The location of all sample points will be staked and labeled in the field. AKT field personnel will use measuring equipment in combination with existing site features to obtain horizontal control of all sample locations. Locations will be measured using triangulation techniques. This data will then be transferred to a scaled map.

5.5 QUALITY ASSURANCE/QUALITY CONTROL SAMPLE COLLECTION

The following quality assurance/quality control (QA/QC) samples will be collected as part of the subsurface investigation: (1) duplicate samples, (2) equipment (decontamination) blanks, (3) volatile organic analysis (VOA) trip blanks, and (4) bottle blanks. The rationale for quality assurance sampling is presented in the QAPP. The required collection frequency of the QA/QC samples is identified in Table 3 of the QAPP. See Table 2 of this Work Plan/SAP for a summary of the QA/QC samples to be collected as part of this subsurface investigation.

5.6 DECONTAMINATION PROCEDURES

5.6.1 Sample Collection Equipment

Prior to drilling each soil boring, sampling tools will be thoroughly cleaned with pressurized hot water from a specific water source. Soil sampling equipment will be cleaned with pressurized hot water prior to moving to the next designated area. If oily residue is present on sampling equipment, the equipment will be rinsed with isopropanol prior to final rinse. Refer to AKT SOP-4 presented in Attachment D of the QAPP for further details on equipment decontamination.

Grossly contaminated wastewater generated during decontamination efforts will be stored in 55-gallon drums in a secure on-site location pending characterization and proper disposal, if encountered.

Disposable equipment will be used for the collection of groundwater samples. Therefore, decontamination of the sampling equipment will not be necessary.

5.6.2 <u>Disposal of Investigation Derived Materials</u>

The following materials may be generated during the investigation activities:

- Disposable personal protective clothing,
- Decontamination water,
- Soil cuttings,
- Disposable groundwater sampling equipment (i.e. metal filters, sampling tubing, and polyvinyl chloride well screen and casing).

5.7 PERSONNEL MONITORING

During investigation activities, air monitoring be conducted to ensure that the proper level of PPE is being used. A PID will be used for periodic evaluation of organic vapor in the breathing zone. AKT's site representatives will record the measurements, including time of measurement, in a field logbook. Recordings will be taken at least every 4 hours or more often if field personnel determine it is needed.

The personal air monitoring conducted at the property will be evaluated by the site geologist/engineer for use in determining adequate levels of protection for the field team. Additional personal air monitoring will be implemented if conditions warrant. The PID will be operated in accordance with AKT SOP-5. Details of personnel monitoring are presented in the Site-Specific Health and Safety Plan (HASP), presented as Exhibit 2 or the QAPP.

5.8 CHAIN-OF-CUSTODY

Chain-of-custody protocol is necessary to ensure the integrity of samples from the time of collection to data reporting. Chain-of-custody protocols include proper sample labeling, sample sealing, sample storage, sample shipment, and chain-of-custody recording. Refer to Section 2.3 of the QAPP for the detailed explanation of sample custody procedures.

5.9 HEALTH AND SAFETY PLAN

The site HASP provides guidelines and procedures to protect the health and safety of personnel conducting field activities. A copy of the site specific HASP has been prepared under separate cover, as Exhibit 2 of the QAPP. The plan has been developed based on requirements contained in the following regulations and guidance documents:

- 29 CFR 1910.120: Safety and Health Regulation for General Industry, Occupational Safety and Health Administration (OSHA), as amended, December 1986.
- Standard Operating Safety Guides, U.S. Environmental Protection Agency (EPA), 1992.
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute of Occupational Safety and Health Administration (NIOSH), Publication No. 85-115, October 1985.

The HASP is based on information available at the time of development of this Work Plan/SAP, and is subject to revision as new data and information on potential health and safety hazards at the property becomes available.

AKT ENVIRONMENTAL CONSULTANTS, INC.

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WORK PLAN DESCRIPTION

Γ						SOIL SAMPLES			GROUNDWATER SAMPLES			
	AREA NUMBER	LOCATION DESCRIPTION	PROPOSED ACTION	ANALYTICAL SAMPLE SELECTION	VOCs (in Med	BNAs	PCBs & Pesticides	Metals	VOCs	BNAs	PCBs & Pesticides	Metals
OC STATE OF THE ST	NA		Ten soil borings to 16 feet or until underlying clay or bedrock is encountered.	SOIL: Known and/or suspected depth of release, visual identification of soil staining, concentrated petroleum based odors, highest PID level reading, fill sand to clay interface. WATER: Upper three feet of the water table.	20	20	20	20	6	6	6	6
	NA	Debris Piles	Eight soil samples from the debris piles.	SOIL: 0-6 inches	8	8	8	8	0	0	0	0
_				TOTALS:	28	28	28	28	6	6	6	6

NOTES:

^{1.} If groundwater is encountered, up to six (6) groundwater samples will be collected for complete analysis.



WORK PLAN DESCRIPTION

		PROPOSED ACTION	ANALYTICAL SAMPLE SELECTION	SOIL SAMPLES			GROUNDWATER SAMPLES				
AREA NUMBER	ATION DESCRIP			VOCs	BNAs	PCBs & Pesticides	Metals	VOCs	BNAs	PCBs & Pesticides	Metals
NA	Fill Material	Ten soil borings to 16 feet or until underlying clay or bedrock is encountered.	SOIL: Known and/or suspected depth of release, visual identification of soil staining, concentrated petroleum based odors, highest PID level reading, fill sand to clay interface. WATER: Upper three feet of the water table.	20	20	20	20	6	6	6	6
NA	Debris Piles	Eight soil samples from the debris piles.	SOIL: 0-6 inches	8	8	8	8	0	0	0	0
	1		TOTALS:	28	28	28	28	6	6	6	6

rundwater samples will be collected for complete analysis.
enzene, 1,2,4-Trimethylbenzene, 1,2-Dibromoethane & 1,2-Dichloroethane). Applicable to DLZ Laboratory only.

QA/QC COLLECTION REQUIREMENTS

	Solid Samples						
Sample Name	VOCs	BNAs	PCBs & Pesticides	Metals			
Sample Duplicate**	1	1	1	1			
Equipment Blank	NA	NA	NA	NA			
Bottle Blank	NA	NA	NA	NA			
TOTAL SAMPLES:	1	1	1	1			

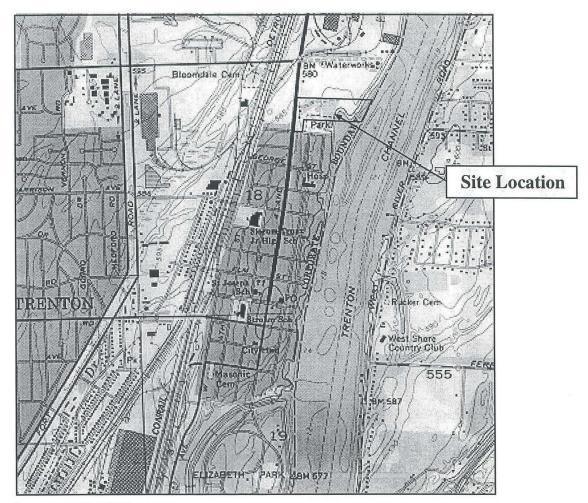
	Liquid Samples						
Sample Name	VOCs	BNAs	PCBs & Pesticides	Metals			
Sample Duplicate	1	1	1	1			
VOA Trip Blank	2	NA	NA	NA			
Decon Blank (Probe Equipment)	2	2	2	2			
Decon Blank (Soil Bowl)	2	2	2	2			
Decon Blank (Water Pump)	2	2	2	2			
Bottle Blank	1	1	1	1			
TOTAL SAMPLES:	10	8	8	8			

NOTE: ** Indicates that no additional soil samples required for duplicate.

⁺ Water pump decon sample required only if groundwater samples obtained.

FIGURES





Source: USGS 7.5 Minute Wyandotte, Michigan Quadrangle

Figure 1.

Topographic Site Location Map
Trenton Riverfront Property
16.75-Acre Parcel, West Jefferson Avenue

			16.75-Acre Parcel, West Jefferson Avenue
0	2000	4000	Trenton, Michigan
Scale		1000	Wayne County
	Feet		AKT Project No. 1600.20-01

